Preface

The author of Bridge Design Manual (BDM) is the Methods Section of the Office of Bridges and Structures.

When complete, the BDM will replace the policies of the latest hard-copy editions of Aesthetic Bridge Design Guidelines, Criteria for Falsework Check, and similar documents. Where production of the manual indicates gaps in existing office policies the manual will include sections for new policies.

Dual unit systems are used throughout most sections of the BDM. Customary U.S. or English unit values are given first, followed by SI or metric unit values in parenthesis.

The BDM shall be used with other Iowa DOT documents and standards including the latest editions of the Office of Bridges and Structures Standards, the Office of Materials Instructional Memoranda, and Standard Specifications for Highway and Bridge Construction. It also shall be used with the 2012 6th Edition of AASHTO LRFD Bridge Design Specifications with the latest interims, except as noted, and the 2002 edition of the AASHTO Standard Specifications for Highway Bridges with current errata changes. A list of reference documents and standards along with abbreviations is given in the Introduction section. An additional list is given with each major article or section.

Office of Bridges and Structures documents are available on the office web site:

http://www.iowadot.gov/bridge/index.htm

and Iowa DOT documents are available in the Electronic Reference Library:

http://www.iowadot.gov/erl/index.html

At this time the office no longer is maintaining the allowable stress design/load factor design (ASD/LFD) manual or the metric standard sheets. Until they are updated for LRFD, one~~two~~ section~~s~~ of the ASD/LFD manual are included with the LRFD BDM.

- ~~5.3 Haunches~~
- 10.2 Sign Supports

The present bridge and culvert design policy is as follows [FHWA Memorandum and Attachment].

- All bridge projects started after 1 October 2007 shall have the superstructures designed using the AASHTO LRFD Specifications.
- With the release of BDM Section 6.6, Piers, the substructures of bridge projects started after 1 January 2009 shall be designed using the AASHTO LRFD Specifications. J-, H-, and RS-Standards conform to this policy.
- Exceptions to these LRFD policies will be considered based on development issues associated with the overall project. In general, if preliminary design (completion of the TS&L) was completed prior to October 2007, the AASHTO Standard Specifications may be used in final design.
- ~~Section 5.3 Haunches generally is not affected by the change from ASD/LFD to LRFD.~~
- Pile contract lengths and target driving resistances shall be determined with the AASHTO LRFD Specifications and January 2013 BDM Section 6.2, Piles, newly revised for ISU research. Additional dates associated with changes to LRFD for piles are the following:
  - January 2013: Revised pile design examples available
  - April 2013: Revised J-, H-, and RS-Standards available
  - July 2013: For contract letting, consultant-designed bridges to use revised LRFD for piles
  - 2017: Proposed sunset of Iowa DOT ENR Formulas for construction control.
- Reinforced concrete box culverts and flumes shall be designed by LRFD using BDM Section 8, Culverts, LRFD English Culvert Standards, and LRFD Precast Culvert Standards.
- Repairs shall continue to follow guidelines in the repair section.

- BDM Section 10.2, Sign Supports, which is based on AASHTO's Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, Fifth Edition and 2011 Interim Revisions, remains allowable stress design to match the AASHTO standard.

The office has modified long-standing practice to increase design strength for Class C concrete from f'_c = 3500 psi to f'_c = 4.0 ksi.

In general the BDM is intended to define office practice for typical Iowa bridges without restricting innovation for unusual site and design conditions. The words "shall", "required", "office policy", and similar terms indicate mandatory specifications that need to be followed unless exceptions are approved by the supervising Section Leader. Other terms such as "should", "prefer", and "recommended" indicate general guidance subject to engineering judgment of the designer. Interpretations of the supervising Section Leader, the Chief Structural Engineer, the Assistant Bridge Engineer, and the Bridge Engineer supersede policies in this manual.

This manual will be supplemented with memos that update policies. The memos will be issued at the beginning of each month through the "Graphicmail" service. Once issued, the memos will be available on the office web site, along with all of the archived Methods Memos issued from 2001 through 2009. The user should be careful when reviewing the Methods Memos because some are obsolete, and some include policies that have been partially revised and/or references that have been updated.

Revision dates will be given on the footer for each section or article. While the manual is in production there are no plans to issue paper copies or specific editions.

Standard CADD notes are provided in Section 11 at the end of the manual.

The BDM does not include design procedures, examples, or software. For office use, separate documents and access systems will be developed as design aids.

Users are invited to bring errors and omissions to the attention of the Methods Section of the Office of Bridges and Structures.

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